

REMARKS

1. Claim Amendments

The April 16 amendments to claim 227 specified that the apparatus includes a main chamber, a residence chamber and an airlock, and that a communication port is located between the main chamber and a residence chamber and thus is not the airlock. The instant amendment clarifies that the airlock is itself a chamber, and communicates with the main chamber, but is separate from both the main chamber and the residence chamber(s). The instant amendment also clarifies the relationship of the communication port to the residence chamber. The communication port would normally be a door, cp. Figure 3.

Claim 241 has been cancelled.

2. Prior Art Rejections (OA pp. 2-18)

2.1. Claims 227, 228, 231, 234, 235, 237 and 238 stand rejected as obvious over Findley (USP 4,892,830; 1990) in view of Lindenberg (WO 99/67365) and Ellington (USP 6,140,121; 2000).

Amended claim 227 describes a main chamber with an airlock and at least one residence chambers located inside or connected to the main chamber. The oxygen tension of the main chamber and the at least one residence chambers can be regulated independently.

In the "Response to Arguments" at page 2, lines 1-10, the Examiner states:

Applicant's arguments filed on 4/16/2008 have been fully considered but they are not persuasive. The applicant's argument the newly amended claim 227 discloses the main chamber, the residence chamber and the airlock as separate entities wherein the oxygen tension of the main chamber and the residence chamber are independently changed and that the prior art combined does not disclose such feature was not found persuasive because it is not stated in the claim language of claim 227 that the main chamber, the residence chamber and the airlock are separate entities. The claim merely states that the device contains the

above chamber. Hence based on the broad reasonable interpretation the examiner believes the air-lock chamber can be used/can serve as both the airlock and the residence chamber.

Claim 227, as previously amended, already recited that the main chamber and the residence chamber(s) were "separate". Note that "separate" must be interpreted in the context of the further limitation that (1) the residence chamber(s) are "located inside the main chamber and/or are attached to the main chamber", and (2) the residence chamber(s) communicate with the main chamber by means of communication port(s).

Claim 227, as now amended, recites that the airlock is itself a chamber, separate from both the main chamber and the residence chamber(s).

It therefore appears that the claims are now completely commensurate with the "separate entities" argument alluded to by the examiner.

Since the lack of such commensurateness was the Examiner's sole rebuttal to applicant's arguments, we believe that the case should now be in condition for allowance. However, out of a sense of caution, we have updated the prior argumentation to reflect the current rejection.

The invention is non-obvious in respect to the art relied on by the Office Action of 22 October 2008 for the reasons presented below.

Findley et al (US 4,892,830)

Findley et al describes an environmentally controlled incubator ("main chamber") having an airlock and a storage compartment. The incubator includes sensors for determining the oxygen and carbon dioxide concentration within the chamber and means for adding carbon dioxide, nitrogen or oxygen to the ambient gas within the incubator in order to maintain the desired levels of carbon dioxide and oxygen.

The Examiner initially states that the "main chamber" 13 and

"airlock" 57 as described by Findley et al are the "main chamber" and the "residence chamber" of the invention described in the present patent application and that the oxygen tension may be changed independently in these two chambers (Office Action page 2 bottom). However, the Examiner also states that the "residence chamber" of the present patent application is the "storage compartment" 68 of Findley et al (Office Action page 3 top).

Amended claim 227 specify the existence of a main chamber, a residence chamber and an air-lock, as separate entities, hereby only the "storage compartment" of Findley et al can be compared with the "residence chamber" of the present claim.

Findley et al when referring to Fig. 5-6 describes that "an interior platform and storage compartment 68 may be provided within the chamber 13 to the right of the microscope stage 25 for providing additional storage space for culture dishes and other items within the chamber 13. Preferably the top surface 76 of the platform 77 is at the same height as that of the microscope stage 25. The hinged top sections 78 of the platform 77 may be opened for access to the interior storage compartment. Apertures in the side walls 79 and 80 of the platform 77 permit circulation of gas through the interior of the platform for maintaining appropriate storage conditions" (column 7, lines 27-40).

From the above quotation it can be seen that the oxygen tension of the storage compartment is the same as in the chamber 13 i.e. of the main chamber as "apertures in the side walls 79 and 80 of the platform 77 permit circulation of gas through the interior of the platform for maintaining appropriate storage conditions". In Fig. 6 it is clearly indicated by arrows that the air can circulate through the apertures of the side walls 79 and 80. Thus when having air circulating from the chamber 13 (main chamber) and through the storage compartment 68 these chambers are not independently regulated in respect of the oxygen tension.

The invention of the present patent application is a system with an apparatus having a main chamber and one or more residence chambers located inside or attached to the main chamber. All of

these chambers can be regulated independently in respect of oxygen tension. Also the apparatus has an airlock distinct from these chambers.

Lindenberg et al (WO99/67365)

The document describes a method for in vitro maturation of a human gamete by culturing an immature human gamete in a chemically defined cell culture medium. It is described that the immature oocytes are aspirated transvaginally with a 17 g Cook needle (page 11, line 5). Some culturing conditions are also described e.g. 5% CO₂.

The document does not describe the physical apparatus for in vitro producing a mammalian pre-embryo.

Ellington et al (US 6,140,121)

The document describes methods and compositions to improve germ cell and embryo survival and function. Use of different compounds and different methods in the process of obtaining motile sperm having improved function are described.

In the process of washing or isolating a sperm sample it is described that sperm are isolated by a swim-up method by which sperm are layered in wash medium using a 27 gauge needle (column 14, lines 44-55).

The document does not describe the physical apparatus for in vitro producing a mammalian pre-embryo

Conclusion in respect of Findley et al, Lindenberg et al and Ellington et al

The documents of Findley et al, Lindenberg et al and Ellington et al do not when taken together describe a system of claim 227, as these documents do not describe an apparatus with a main chamber, at least one residence chamber and an air lock, where the oxygen tension of the main chamber and the at least one residence chamber are independently changed.

Thus it is not obvious for the person skilled in the art to

invent the invention as described in amended claim 227 of the present patent application.

2.2. Claims 229 and 242-244 are rejected as obvious over the "227" art in view of Burkman (1988) (OA pp. 8-10).

Burkman et al describes a microperfusion chamber for study of mammalian spermatozoa. A population containing as few as several hundred sperm cells may be observed in the chamber during successive changes of the suspending medium as controlled by a perfusion pump. The percentage of motile cells, linear swimming speed and incidence of hyperactivated motility are reported. In the washing process it is described that pH increased due to loss of CO₂, and it is proposed to use a gas tight syringe to eliminate the problem (page 106, Experiment 3).

2.3. Claims 230, 232 and 233 are rejected as obvious over the "227" art in view of Orchard, USP 5,169,217 (OA pp. 10-13).

Orchard et al describes a controlled environment chamber apparatus for maintaining biological material under controlled conditions of temperature and/or humidity comprises a cabinet defining a chamber, a door for controlling access to the chamber, and a clean air source for providing a flow of clean air past the chamber opening (the abstract).

2.4. Claim 236 is rejected as obvious over the "235" art in view of Ranoux, USP 6,050,935 (OA pp. 13-14).

Ranoux et al describes a container assembly for intravaginal fertilization and culture and embryo transfer and method of intravaginal fertilization and culture employing such a container. Described is an intra-vaginal fertilization and culture container in which embryos may be easily located and inspected microscopically in situ and which enables the subsequent transfer directly from the container to the uterine cavity by means of a catheter or the like (column 2, lines 53-58). It is also described that the container has a main chamber

and an microchamber adapted to collect one or more embryos for microscopic inspection and/or retrieval (column 3, lines 27-34) and that the material should be CO₂ permeable (column 5, line 14).

2.5. Claims 239 and 240 are rejected over the 227 art in view of Vajta, USP 6,399,375 (OA pp. 14-16).

Vajta describes a method and apparatus for culturing cells and tissues. The apparatus being an incubator comprises a tank to be filled with a liquid. The incubator also has a cover. Flexible bags etc with cell cultures can be located within the incubator and heated by heating the liquid of the incubator. The flexible bags can be supplied with preheated gas mixture (paragraph 40 and 41).

2.6. Claim 241 is rejected as obvious over the 227 art in view of Campbell, US Pub. 2002/0068358 (OA pp. 16-17).

Campbell teaches a computer-controlled support assembly.

2.7. None of the additional documents (Burkman, Orchard, Ranoux, Vajta, Campbell) overcome the deficiency of the "227" art, i.e., none of them teach a system with a main chamber and a residence chamber wherein the oxygen tension of these chambers can be independently regulated. Thus, claim 227 is non-obvious. It follows that all claims dependent on 227 are also non-obvious.

Respectfully submitted,

BROWDY AND NEIMARK, P.L.L.C.
Attorneys for Applicant

By: 

Iver P. Cooper
Reg. No. 28,005

624 Ninth Street, N.W.
Washington, D.C. 20001
Telephone: (202) 628-5197
Facsimile: (202) 737-3528
IPC:lms

G:\ipc\g-i\hoib\Lindenberg3\lindenberg3.pto amendmentaftfnl.wpd